— The invention solves the problem of maintaining Route Information Field (RIF) information in a router for populating the RIF field of packets routed by the router, by storing the RIF information with the Layer 2 address in the address binding table. The address binding table establishes a binding between a Layer 2 address and a Layer 3 address of a station. The Layer 2 address in the address binding table is extended to include the RIF information. The address binding table is normally maintained in the router in an architecture which permits rapid access for fast switching such as cut through routing. A separate RIF cache table, requiring a separate time consuming table look-up is thereby avoided. The address binding table is referred to as the Address Resolution Protocol (ARP) Table in IP protocol. The Layer 2 address is extended to include both MAC address and RIF information. The RIF information in the Layer 2 field of the ARP table is updated in response to execution of an ARP Explorer protocol by the router. RIF information is read from an ARP Explorer response packet and written into the Layer 2 field of the ARP table. The Layer 2 address, both MAC address and RIF information, is read from the ARP table for use in populating both the destination address field and the RIF field of a routed packet. —

REMARKS

This Amendment is in response to the Office action dated December 10, 2002. All objections and rejections are respectfully traversed.

Claims 1-23 are in the case.

Claims 1, 3, 5, 6, 8, and 10-14 were amended to better claim the invention.

At paragraph 1 of the Office Action the abstract of the disclosure was objected to for informalities. The abstract has been amended, and is believed to be in acceptable condition. It is believed that no new matter has been entered.

At paragraph 2 of the Office Action the disclosure was objected to because of informalities. The disclosure has been amended, and is believed to be in acceptable condition. Also, at paragraph 3, Applicant was requested to correct any minor errors in the specification. Applicant is not aware of any errors in the specification, and it is believed to be in allowable condition. It is believed that no new matter has been entered.

At paragraph 4 of the Office Action claims 1 and 10-14 were objected to because of informalities. Claims 1 and 10-14 have been amended, and are believed to be in allowable condition.

At paragraph 5 of the Office Action claims 1-23 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 1, 5, and 10-14 have been amended, and all claims are believed to be in allowable condition.

At paragraph 6 of the Office Action the Examiner pointed out Applicant's duty under 37 C.F.R. §1.56 to point out the inventor and invention dates of each claim that was not commonly owned. Applicant submits that all claims are commonly owned by all named inventors.

At paragraph 7 of the Office Action claims 1, 2, 4, 5, and 10-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bingham et al., U.S. Patent No. 6,198,747 issued on March 6, 2001, hereinafter Bingham, in view of Hashimoto, U.S. Patent No. 5,815,668 issued on September 29, 1998.

The present invention, as set forth in representative claim 1 comprises in part:

1. A method for routing a source routed packet to a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in a router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, ***said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station; and***

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station.

Bingham discloses a system and method for creating a routing information field (RIF) for an unknown destination router by sending an address resolution protocol (ARP) message to known routers of the network. The originating router then receives responses from the routers with information required to build the RIF, including the physical MAC addresses of the routers in the network. The originating router then stores the RIF in a table for future lookups of router addresses.

Hashimoto discloses a system for creating a routing table in a router having the physical addresses table and the network addresses table containing information on the routers in a network. Hashimoto explains how the "master" and "slave" network devices have the same tables.

Applicant respectfully urges that neither Bingham nor Hashimoto show Applicant's claimed novel "***said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station; and writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet.***"

Applicant's presently claimed invention is directed to maintaining a routing table containing a physical MAC address ***and*** routing information, and writing both of these fields into a packet before routing the packet. In this way, a separate RIF table, requiring a separate time-consuming table look-up, is avoided, since the RIF information is now kept in the address binding table (ARP) which permits rapid access for fast switching. Neither Bingham nor Hashimoto address merging both fields into one table, nor do either show writing these fields, as part of the same entry, into a packet prior to routing the packet to alleviate future look-up of the information.

Applicant respectfully urges that the Bingham patent and the Hashimoto patent, either taken singly or taken in any combination are legally insufficient to render the presently claimed invention obvious under 35 U.S.C. §103(a) because of the absence in each of the cited patents of Applicant's claimed novel "***said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station; and writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet.***"

At paragraph 10 of the Office Action examiner stated that claims 3 and 6-9 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Claims 3, 6, and 8 have been amended into independent form, and all claims 3, and 6-9 are believed to be in condition for allowance.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

PATENTS
112025-0116

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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MARK-UP PAGES FOR THE MARCH 7, 2003, AMENDMENT TO U.S. PATENT APPLICATION SER. NO. 09/283,125

The replacement for the first full paragraph of page 2 resulted from the following changes:

This Patent Application is related to a patent application filed by Pearce, et al. titled "Duplicate Ignore Delay Timer for ARP Like Protocol Messages using ARE Protocol", U.S. Patent Application Serial Number 09/283,124, [Attorney Docket No. 112025-0113,] filed on even date with this patent application [, and having Serial Number _____].

The replacement for the Abstract resulted from the following changes:

The invention solves the problem of maintaining Route Information Field (RIF) information in a router for populating the RIF field of packets routed by the router, by storing the RIF information with the Layer 2 address in the address binding table. The address binding table establishes a binding between a Layer 2 address and a Layer 3 address of a station. The Layer 2 address in the address binding table is extended to include the RIF information. The address binding table is normally maintained in the router in an architecture which permits rapid access for fast switching such as cut through routing. A separate RIF cache table, requiring a separate time consuming table look-up is thereby avoided. The address binding table is referred to as the Address Resolution Protocol (ARP) Table in IP protocol. The Layer 2 address is extended to include both MAC address and RIF information. The RIF information in the Layer 2 field of the ARP table is updated in response to execution of an ARP Explorer protocol by the router. RIF information is read from an ARP Explorer response packet and written into the Layer 2 field of the ARP table. The Layer 2 address, both MAC address and RIF information, is read from the ARP table for use in populating both the destination address field and the RIF field of a routed packet.

The replacement for claims 1, 3, 5, 6, 8, and 10-14 resulted from the following changes:

1. (Amended) A method for routing a source routed packet to [an] a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in a router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station; and

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station.

3. (Amended) A method for routing a source routed packet to a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in a router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station;

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station; and

[The method as in claim 1 further comprising:]

populating said routing information in said ARP table by reading RIF information from a field of an Single Routes Explorer (SRE) packet, either a request or response packet.

5. (Amended) The method as in claim 1 further comprising: updating said second field of said ARP table when said router receives an ARP Explorer request packet from [a] one of said stations on said SRB subnet and said request packet contains RIF information.

6. (Amended) A method for routing a source routed packet to a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in a router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station;

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station; and

[The method as in claim 1 further comprising:]

transmitting an ARP Explorer request packet upon expiration of an ARP table flush timer, and updating said second field of said ARP table in response to receipt of an ARP Explorer response packet transmitted by a station in response to said ARP Explorer request packet.

8. (Amended) A method for routing a source routed packet to a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in a router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station;

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station; and

[The method as in claim 1 further comprising:]

transmitting a validation frame upon expiration of a validation time interval, and in the absence of a response from said validation frame, transmitting an ARP Explorer request packet, and updating said second field of said ARP table in response to receipt of an ARP Explorer response packet transmitted by a station in response to said ARP Explorer request packet.

10. (Amended) A router comprising:

an address resolution protocol table (ARP table), said ARP table maintained in said router, said ARP table having an entry for each station on a Source Route Bridge (SRB) subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said station, said entry having a second field containing a Layer 2 address of said station including a physical (MAC) address and routing information (RIF information) from said router to said each station, and;

a packet format circuit to write required routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to a destination station on a destination SRB subnet.

11. (Amended) A router for routing a source routed packet to [an] a Source Route Bridge (SRB) subnet for a destination station, comprising:

means for maintaining an address resolution protocol table (ARP table) in [a] said router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station, and;

means for writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station.

12. (Amended) A computer readable device containing a computer program for performing a method of routing a source routed packet to [an] a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in a router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station, and;

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station.

13. (Amended) Electronic data signals received through a port of a router, said electronic data signals for implementing a method for routing a source routed packet to [an] a Source Route Bridge (SRB) subnet for a destination station, comprising:

maintaining an address resolution protocol table (ARP table) in [a] said router having an entry for each station on said SRB subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of said each station, said entry having a second field containing a Layer 2 address of said each station including a physical (MAC) address and routing information (RIF information) from said router to said each station, and;

writing said routing information read from said second field of said ARP table into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said destination station.

14. (Amended) An ARP table data structure stored in a computer memory of a router, comprising:

an entry for each station on [an] a Source Route Bridge (SRB) subnet to which said router routes packets, said entry having a first field containing a Layer 3 address of each said station, said entry having a second field containing a Layer 2 address of said station including a physical (MAC) address and routing information (RIF information) from said router to said each station, said routing information in said second field of said ARP table used for writing RIF information into a Route Information Field (RIF) in a message packet before routing said message packet to said SRB subnet for said each station.

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